REMARKS/ARGUMENTS

Favorable consideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 9-11, 14, 15, 24-46,[1] and 48-53 are pending in this application. Claims 1-8, 12, 13, 16-23, and 47 have all been previously canceled without prejudice or disclaimer. Claims 9, 25-29, and 36 have been amended to even better clarify the invention without the introduction of any new matter as discussed in detail below.

The outstanding Official Action presents an objection to the amendment filed September 29, 2003, a rejection of Claims 9-11, 14, 15, 25-46, and 48-53 under the first paragraph of 35 U.S.C. § 112, a rejection of Claims 9-11, 14, 15, 24-29, 34-45, and 48-53 under 35 U.S.C. § 103(a) as being unpatentable over Rogers et al, (U.S. patent No. 4,571,819, Rogers) in view of Lee et al (U.S. Patent No. 4,952,524, Lee), and a rejection of Claims 30-33 and 46 as being unpatentable over Rogers in view of Lee and in further view of Dash et al. (U.S. Patent No. 5,173,439, Dash).

The objection made at page 2 of the outstanding Action as to the Amendment filed September 29, 2003, appears to be based on language that the amendment adds to the claims, specifically Claims 9, 25-29, and 36 noted at the bottom of paragraph 3 on the bottom of page 2 of the outstanding Action. However, the case of In re Rasmussen, 211 USPQ 323 (CCPA 1981), MPEP §706.03(o) (at col. 1 on page 700-68 of Rev. 1, Feb. 2003), MPEP §2163.01, and MPEP §2163.06 make it clear that a 35 U.S.C. §132 objection is only to be used "as an objection to amendments to the abstract, specification or drawings," not as an objection to claim amendments. Instead, an assertion of new matter being added to the claims is to be

[1] Page 2 and the "office Action Summary" of the outstanding Action are incorrect in indicating that Claims 25-46 are pending instead of the actual pending Claims 24-46. This error is further clear from the rejection made as to Claim 24 at page 4 of the outstanding Action.

made as a rejection of those claims under the written description requirement of the first paragraph of 35 U.S.C. § 112 as spelled out in MPEP §2163.06 citing Rasmussen. Accordingly, the withdrawal of this clearly improper and un-authorized objection to Claims 9, 25-29, and 36 is respectfully submitted to be in order.

The outstanding Action does present a rejection of Claims 9-11, 14, 15, 25-46, and 48-53, but not Claim 24, under the first paragraph of 35 U.S.C. § 112 that asserts a violation of the written description requirement of this section because of an allegation that the limitations of **"without using doped silicon oxide containing a melting-temperature-lowering dopant for lowering the melting-temperature of the silicon oxide for performing reflow by doped silicon oxide for planarization," "which does not contain the melting-temperature-lowering dopant,"** and **"by annealing the semiconductor substrate so as not to melt the oxide films,"** which were introduced in the Amendment filed September 29, 2003, do not "have basis in the original disclosure" citing In re Schecter and MPEP §2173.05(i) .

However, MPEP §2173.05(i) merely points out that the *Schecter* case represents older decisions critical of negative limitations that are not in accord with the current view of the more recent decisions noted therein as controlling. Also, while this section does note the requirement for a "basis in the original disclosure" it does not state that there must be literal support present in the specification. In fact, this section cautions examiners that "a lack of literal basis in the specification may not be sufficient to establish a *prima facie* case for lack of descriptive support."

This caution is clearly present because controlling court decisions are clear that the U.S.PTO may not interpret the written description requirement to require literal (exact word) support in the specification. See e.g., Martin v. Johnson 172 USPQ 391, 395 (CCPA 1972)

(stating "the description need not be in ipsis verbis [i.e. "in the same words"] to be sufficient"). The PTO further acknowledges this controlling court precedent in MPEP §2163.02 that notes that "[t]he subject matter of the claim need not be described literally (i.e., using the same terms or *in haec verba*) in order for the disclosure to satisfy the description requirement" (col 1 on page 2100-172 of Rev. 1, Feb. 2003).

MPEP §2163(II)(A)(3)(a) (at col. 2 on page 2100-106 of Rev. 1, Feb. 2003) further notes that "[w]hat is conventional or well known to one of ordinary skill in the art need not be disclosed in detail ... ."

Page 3, lines 32-36, of the original specification states "....., it is difficult in the existing state to obtain high purity organic silicon source because of limitation in a material refining technique for the organic silicon source." The worker of ordinary skill in the art would be clearly taught by this statement that the goal of the present invention pertains to obtaining the noted high purity organic silicon source. As workers of ordinary skill in the art would clearly further understand, the term "**non doped**" means that the material described as being "**non doped**" does not contain shallow acceptors, such as boron, or shallow donors, such as phosphorous, which are electrically active in the semiconductor materials. Workers of ordinary skill in the art would further know that if TEOS contains boron and phosphorus, it is referred to with an acronym such as "BPTEOS" or as being "doped TEOS." The worker of ordinary skill in the art would, thus, understand that there is a distinction as between "TEOS" and "BPTEOS." Note, for example, the abstract and col. 4, lines 31-38 in Lee, relied upon to reject the claims based upon obviousness. Clearly, those of ordinary skill in the art understand that the term "TEOS" means non-doped TEOS. See the specification at page 25, line 15, and the express statement that "TEOS" is used as the organic silicon source.

In light of the above noted case law and MPEP guidance, this disclosure alone provides clear support.

Further in this regard, the disclosure of other suitable materials (TMOS or TPOS) does not erase the disclosure of TEOS and the mere fact that an oxidizing agent can be included does not mean that they must be included or that these agents are like the prohibited dopants. Thus, even though page 19, lines 30-36, of the specification states ".... oxidizing agent such as N_2O, O_2, or O_3 is added may also be employed. In addition, the grooves 6 may be buried by the silicon oxide film in terms of CVD using, as source material, organic silicon source, silicon-hydrogen compound such as SiH_4, or silicon chloride such as $SiCl_4$ alone" and page 28, lines 11-18, states "the organic silicon source into which oxidizing agent, for instance, N_2O, O_2, or O_3 is added may also be used. In addition, in terms of CVD using organic silicon source, silicon hydrogen compound such as SiH_4, or silicon chloride such as $SiCl_4$," there is no disclosure that dopants reducing melting temperature, like boron and phosphorus, are contained

In order that there can be no confusion as to the nature of the melting-temperature-lowering dopant that will lower the melting-temperature of the silicon oxide, the independent claims all now clarify that the "doppant" that is not present is a "dopant of boron or phosphorus" relative to the above-noted disclosure of a "TEOS" organic silicon source which the artisan would clearly understand to be lacking a "dopant of boron or phosphorus" unlike BPTEOS.

In addition, Fig. 7B of this application shows clearly the relationships between the etching rates of the claimed non-doped oxide film and annealing temperature. If the oxide films are doped with boron or phosphorus, the relationships between the etching rates and annealing temperature show different curves.

Further in this regard, if the oxide films were doped with boron or phosphorus, the Raman spectra shown in Figs. 6A and 6B of this application would indicate its presence because of peaks in the curves illustrated there would have specific known boron and phosphorus peaks. Note that the **Journal of Non-Crystalline Solids** article attached to the Amendment filed November 7, 2002, shows that if the silicon oxide film contains boron, the Raman spectra should have a peak at 670 cm^{-1} (See Fig.3 and table 3 of **Journal of Non-Crystalline Solids**). Further, if the measured silicon oxide film had contained phosphorus, the Raman spectra should have a peak at 520 cm^{-1} (See Fig.4 and table 4 of **Journal of Non-Crystalline Solids**). As no peak at 670 cm^{-1} or 520 cm^{-1} appears in Figs. 6A and 6B of this application, it is inherent that the silicon oxide film has no dopant of boron or phosphorous. Such inherency further establishes the specification support for the claimed lack of dopants now specified to be boron or phosphorous. See MPEP §2163.07(a) citing In re Reynolds, 170 USPQ 94 (CCPA 1971) and In re Smythe, 178 USPQ 279 (CCPA 1973).

Turning to the rejection of Claims 9-11, 14, 15, 24-29, 34-45, and 48-53 under 35 U.S.C. § 103(a) as being unpatentable over Rogers in view of Lee, it is noted that the paragraph bridging pages 4 and 5 of the outstanding Action assumes that the Rogers use of doped silicon oxide that has a melting temperature lowering dopant of boron or phosphorous to lower the melting temperature of the doped silicon oxide to perform reflow for planarization is instead somehow disclosed to be part of an "annealing ... so that dislocation density generated in the corresponding device region in a vicinity of the grooves is minimized." The outstanding Action thus errs by ignoring that the Rogers process demands dopants of boron and phosphorous to be present for the required melting temperature reduction. Further note col. 5, lines 55-62 of Rogers disclosing that the silicon dioxide layer 19 is to be formed to a thickness of 2.5 microns with 3-9 weight % impurities such as

phosphorus or boron, for example. This need for dopants in the silicon oxide could not be clearer nor could the need for the SiN layer to block diffusion of the dopant into the underlying structure be any less clear. See col. 3, lines 35-37 and lines 49-52.

Clearly, Rogers includes no disclosure or suggestion of the claimed absence of a reflow-method using doped silicon oxide for planarization, the doped silicon oxide containing a melting-temperature-lowering dopant **of boron or phosphorus** for lowering the melting-temperature of the silicon oxide. Note further that col. 6, lines 18-22, of Rogers state that the doped glass is melted and reflowed by applying a temperature of about 950 degree to 1,150 degree C. Further, col. 6, lines 26-29, of Rogers state that the process collapses the voids 21-21 and reflows the upper surface 26 of the glass to a substantially level topography, the main objective of Rogers.

Further, Rogers fails to teach or suggest the claimed step of depositing oxide films in the grooves by a CVD method using an electrically inert organic silicon source, which does not contain the melting-temperature-lowering dopant of boron and phosphorous. Col. 5, lines 55-62, of Rogers state that the doped silicon dioxide glass layer 19 is formed to a thickness of about 2.5 microns containing 3-9 weight percent of impurities such as phosphorus or boron, e.g., using the low pressure chemical vapor deposition technique.

Furthermore, Rogers is silent about changing the ring structure of the oxide films by annealing the semiconductor substrate without melting the oxide films. As indicated above, col. 6, lines 18-22, of Rogers state that the doped glass is melted and reflowed.

Turning now to Lee, there is no disclosure or suggestion of the claimed method that is done without using any melting-temperature-lowering dopant **of boron or phosphorus** for lowering the melting-temperature of the silicon oxide. Col. 4, lines 51-57, of Lee state that the layer 23 is formed from precursors, together with dopants, provided the doping level in

the layer 23 is lower than in the layer 25 so that the layer 25 will have a lower flow temperature than layer 23. Moreover, col. 4 , lines 58-60, of Lee state that the flow properties of dielectrics deposited from BPTEOS are substantially influenced by the percentages of included boron and phosphorous. Further, claims 1 and 13 of Lee prescribe the step of depositing a filler material upon said thermal stress relief layer, said filler material having a flow temperature which is lower than the flow temperature of said thermal stress relief layer, claims 5 and 6 of Lee sate that the filler material contains dopant of boron and phosphorous. Furthermore, claim 13 of Lee prescribes the step of heating the flowable filler material to cause the filler material to flow.

Further, Lee fails to teach or suggest the claimed depositing of oxide films in the grooves by a CVD method using an electrically inert organic silicon source, which does not contain the melting-temperature-lowering dopant of boron and phosphorous. Col. 4, lines 31-38, of Lee teaches the decomposition of TEOS in the presence of phosphorous and boron dopants in a reactor.

Furthermore, Lee is silent about changing a nring structure of the oxide films by annealing the semiconductor substrate so as not melt the oxide films. Col. 5, lines 7-16, of Lee state that after filler material 25 has been deposited, it is flowed by heating it, either in a furnace or by a rapid thermal anneal (RTA) process.

Clearly, the proposed combination of Rogers and Lee does not cure the deficiencies of Rogers, because both references fail to teach or suggest claimed method, which does not use the reflow-method with the doped silicon oxide for planarization.

Moreover, the outstanding Action fails to present a reasonable motivation as to why the artisan would have abandoned the main objective of Rogers In terms of the col. 6, lines

26-29, described intent to collapse the voids 21-21 and to reflow the upper surface 26 of the glass to a substantially level topography that requires the presence of boron or phosphorous. Any proposed modification that would render a reference unsatisfactory for its intended purpose is generally held not to be an obvious one. See In re Gordon, 221 USPQ 1125, 1127 (Fed. Cir. 1984).

The rejection of Claims 30-33 and 46 is further traversed as the teachings of Dash do not cure the deficiencies in Rogers or Lee that were noted above.

As no further issues are believed to remain outstanding in this application, it is believed that this application is clearly in a condition for formal allowance and an early and favorable action to this effect is, therefore, respectfully requested.

Respectfully submitted,

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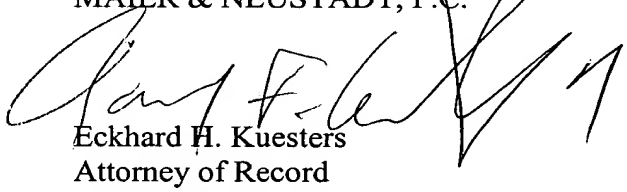

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